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From the Director.....

Highly pathogenic avian influenza invaded Indiana in early 2016. Through the combined efforts of the Board of Animal Health, the USDA, the ADDL, the ISPA, the poultry industry, and many other county and state agencies, the outbreak was quickly contained and eliminated. Testing for initial diagnosis of the disease, for movement of products and to show elimination of the disease was performed in the Molecular Diagnostics section of the ADDL. To meet the testing needs for this emergency, ADDL staff stepped up to perform testing late into the night and on weekends during the outbreak. We are very proud of the dedication and skill of the ADDL staff in their reply to this crisis. Also in this issue of the Diagnostic Forum, we highlight Dr. Yava Jones-Hall, an ADDL pathologist who has undertaken specialty training in Ophthalmic Pathology, and Dr. Sam Yingst, who comes to the ADDL after 28 years in the military, most recently investigating infectious diseases around the world. Dr. Yingst is the Head of the Molecular Diagnostic, Serology and Virology Sections of the ADDL.

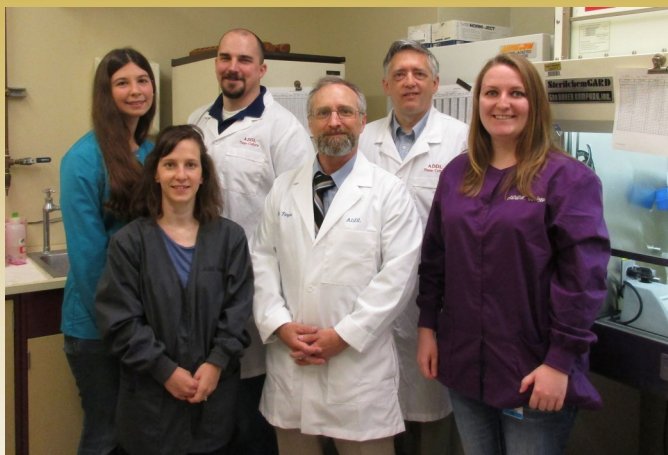
Ophthalmic Pathology

Dr. Jones-Hall received her DVM from Tuskegee University in 2003. Following graduation, she completed a residency in veterinary pathology at Michigan State University (MSU) and a PhD in pathology from MSU and the National Institutes of Health (NIH). Dr. Jones-Hall is an Assistant Professor in the department of Comparative Pathobiology and has served as an experimental and diagnostic pathologist at Purdue University/ADDL for 5 years. Dr. Jones-Hall has a specialty interest in ophthalmic pathology. She recently underwent ocular pathology specialty training at the Comparative Ocular Pathology Laboratory of Wisconsin (COPLOW). The COPLOW was founded in 1983 by Dr. Richard R. Dubielzig, a board certified veterinary pathologist and honorary diplomate of the college of veterinary ophthalmologist. While at COPLOW, Dr. Jones-Hall participated in training with COPLOW residents and ophthalmic pathologists, as well as with the ophthalmology residents/specialists at the University of Wisconsin School of Veterinary Medicine. These rounds consisted of an in depth review of the gross and histopathological lesions of cases that were sent to COPLOW. Dr. Jones-Hall has served as the anatomic pathology consultant for the ophthalmic histology rounds since 2013. Her goal is to expand the ophthalmic pathology services provided by ADDL. She currently serves as the primary ophthalmic pathologist for ADDL and PVM. She welcomes ophthalmic submissions by veterinary practitioners and ophthalmologists.

If you have any questions or would like additional information, please contact Dr. Jones-Hall at the ADDL at 765-494-7440.



Meet our Virology Team!



Pictured left to right: Ariel Werner, Katrina Miller (Lab Supervisor), Scott Gentry, Dr. Sam Yingst (Section Head), Arthur Armstrong and Sara Gertsch

The Virology Section at the Animal Disease Diagnostic Laboratory offers several options for diagnosis of viral disease. Virus isolation (VI) and fluorescent antibody (FA) testing are the primary test methods performed in this section. The lab maintains several cell lines for use in on demand virus isolation and stocks an extensive collection of antibodies for use in the FA test. Species tested range from porcine and bovine to small animals as well as various wild animals such as raccoon and deer. Recent viruses of interest have been the isolation of EHD in deer as well as the influenza outbreak in dogs. In addition to VI and FA, the virology section performs ELISA testing on ear notch and serum samples looking for both acutely and persistently infected BVD cattle. Electron microscopy utilizing negative staining is also performed in Virology and is a useful tool for ID of unknown viruses as well as the diagnosis of enteric disease.

The Virology section is led by Dr. Sam Yingst and is supervised by Katrina Miller. Currently there are four technicians performing testing. Art Armstrong (cell culture), Ariel Werner (Virus Isolation/EM) and Sara Gertsch (FA/ELISA). Scott Gentry provides support in the cell culture laboratory and additional areas as the need arises.

In the future, the Virology Section plans to offer a range of new tests to meet the changing needs of our clientele. For example, we are assessing options for influenza virus antigenic characterization and anti-influenza antibody detection to assist in vaccination decisions. We are striving to utilize next generation sequencing methodology as a potential adjunct or enhancement of several tests. We strive to provide maximally efficient, relevant service and we welcome your feedback.

For a list of tests available in Virology, please visit the ADDL website at <https://www.addl.purdue.edu/TestsFees/BySection.aspx> or contact the Virology section. If, at any time, you have questions about what tests are offered, need help determining the appropriate test method, or clarification on results, you may call the ADDL at 765-494-7440 and ask to speak to the Virology section.

African Swine Fever

Morganne Morrow, January 2016 ADDL extern in diagnostic pathology
Tuskegee University School of Veterinary Medicine, Class of 2016

Abstract

Originally endemic to sub-Saharan Africa, African swine fever virus (ASFV) has spread to many countries around the world, with severe consequences for swine health and commercial swine production. There have been no recorded outbreaks of ASFV in the United States; however, knowledge of ASFV-related diseases and their diagnosis is integral to surveillance and prevention. ASFV has many genotypes, and the clinical signs vary tremendously. Depending on the course of disease, the efficacy and usefulness of available diagnostic tests will vary. Because the virus is transmitted by soft ticks, control has proven challenging.

For the full article, visit www.addl.purdue.edu



Welcome to the ADDL

Dr. Samuel Yingst

Dr. Samuel Yingst joined the Indiana Animal Disease Diagnostic Laboratory in October, 2015. Dr. Yingst is a board certified veterinary microbiologist with over 15 years of experience in diagnostics, global public health and veterinary laboratory microbiology research. His experience includes research (PhD in Virology), diagnostics and capacity building in field and laboratory settings involving viral and bacterial agents of zoonotic and public health importance around the world. His 28 year military career focused on studying and addressing problems in zoonotic disease control, especially in active conflict, post-conflict and unstable settings. Dr. Yingst is currently the Head of the Molecular Diagnostics , Serology and Virology Sections at the ADDL.



In the next issue:

Dr. Craig Bowen, Veterinary Diagnostician

NEW at the ADDL

Giardia Panel

The ADDL Parasitology lab is now offering the *Giardia* Panel for dogs and cats for \$19. This panel includes both the Giardia SNAP® ELISA and a ZnSO₄ qualitative fecal float for enhanced detection of *Giardia* in fecal samples. Reports will include interpretive comments. Please submit a minimum of 1 gram of canine or feline feces and request the *Giardia* Panel on the submission form. For *Giardia* testing in other veterinary species, please request the ZnSO₄ qualitative fecal float.

Congratulations!

Phi Zeta Research Day competition award winners:

Dr. Meaghan Broman (Mentor: Dr. Miller)

Honorable Mention — Poster Award — Clinical/Applied Research

Dr. Yuko Sato (Mentor: Dr. Wakenell)

Honorable Mention — Poster Award — Clinical/Applied Research

Dr. Grant Burcham (Mentor: Dr. Ratliff)

Phi Zeta Manuscript Award — Basic Research

Kelly Ray

2nd Place — DVM Student Research

Purdue's Teaching Academy Graduate Teaching Award

Dr. Tyler Peat and Dr. Mario Sola

Olivia Swailles, a 3rd year DVM student was selected as the **1st Place Student Paper Competition Winner**, an award sponsored by the American Board of Veterinary Toxicology. Her paper was titled "Use of MALDI-TOF Mass Spectrometry to Detect Toxins and Toxicants for Veterinary Diagnostic Toxicology".



Dr. Christina Wilson and Dr. Stephen Hooser presenting Olivia with a check for \$1000.



Dr. Patricia Wakenell received the **United States Department of Agriculture Certificate of Appreciation** For her exceptional contributions to the Multistate Project "Genetic Bases for Resistance and Immunity to Avian Diseases" and for her significant work in avian disease diagnostics and pathology.

Congratulations Dr. Wakenell!

Cyanobacteria (Blue-Green Algae)

By Dr. Christina Wilson and Mary Mengel

Microcystis aeruginosa in ADDL Pond



Although algae growth is common in lakes, ponds, and streams in Indiana, there are some fresh water algal blooms, such as those containing toxic cyanobacteria (known as blue-green algae) that can pose serious health problems

in small animals, birds, aquatic species and livestock. Warm temperatures, combined with sunlight and moderate to high levels of nitrogen or phosphorus, can promote growth of the toxic cyanobacteria *Microcystis* and *Anabaena*.¹ *Microcystis sp.* blue-green algae can produce microcystins, which are potent hepatotoxins. Clinical signs in animals exposed to microcystins are associated with severe liver disease and include diarrhea, vomiting, weakness, palor, recumbency, icterus and shock. In cases of acute toxicity, animals can die within a few hours.² Blood chemistries often reveal increased liver enzymes (ALP, AST, ALP), hyperkalemia and hypoglycemia.² *Anabaena sp.* blue-green algae produce anatoxin-a, which is a potent neurotoxin. Animals exposed to anatoxin-a may have a rapid onset of severe muscle tremors or muscle rigidity, followed by paralysis, cyanosis, or death. In cases of acute exposure, animals often die within minutes.²

Due to the rapid progression of clinical signs for both blue-green algae toxins, preventing exposure is key. Animals are exposed to toxic cyanobacteria through ingesting contaminated water or algae that has attached to their skin or fur after swimming through a toxic, blue-green algae bloom. Therefore, it is important to prevent access to suspect water sources, particularly those in which algal blooms are present. It is also important to prevent animals from accessing water sources that have been treated with herbicides or algicides to kill blue-green algae. After application of these chemicals, the algae cells die, causing large amounts of the toxins inside the cells to be released at once. Therefore, even though the algae bloom may not be visible, the water source can still pose a potential threat to animals.

In cases in which algal blooms are present, diagnostic testing can be performed on water samples at the ADDL to morphologically identify the algae and to detect the presence of the blue-green algae toxins anatoxin-a and microcystins. When collecting samples for diagnostic testing, collect water within 6 inches from the surface into a large, wide-mouth plastic or glass jar. Place sample on ice or refrigerate prior to submission. Use precaution when collecting water samples as the blue-green algae toxins are also dermal irritants.

References


- Puschner, B. and Roegner, A. (2012) Cyanobacterial (blue-green algae) poisoning. *In: Veterinary Toxicology: Basic & Clinical Principles*. R. Gupta (editor). Elsevier, Inc., San Diego, CA, pp. 953-965.
- Roegner, A. and Puschner, B. (2011) Blue-green algae (cyanobacteria). *In: Blackwell's Five Minute Veterinary Consult, Clinical Companion, Small Animal Toxicology*. Osweiler, G.D., Hovda, L.R., Brutlag, A.G., and Lee, J.A. (editors). Wiley-Blackwell, Ames, IA, pp. 687-695.

Questions? Comments? Concerns?

**We value your opinion. Please
contacts us at:**

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ADDL Lab Results are available by:

- ◆ Email (call ADDL with your email address)
- ◆ Fax
- ◆ Internet/Web